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ABSTRACT

A study investigated what reading and study strategies students with identified reading-related learning disabilities employ at the post-secondary setting and how the use of strategies differ for students who succeed in particular courses versus those who do not do as well. Nine students with reading-related learning disabilities participated in the study. Recommended successful strategies for college students with reading-related learning disabilities include: (1) develop a plan for effective time management that includes doing a little work each day; (2) take care of yourself; (3) make connections between what you are doing in different classes and future plans; (4) choose your courses carefully so that you have a balance of courses that will be hard and easy for you; (5)talk to others to get information and get to know instructors and teaching assistants to find out what they expect; (6) find and use mentors; (7) find and use a supportive peer group; (8) have drive and passion; (9) be open to asking for and receiving help; (10) take responsibility for yourself; (11) predict assessments; (12) match work to assessments; and (13) modify your strategies based on feedback. Recommendations for institutions are also included. (Contains 35 references and 5 tables.) (CR)

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Lessons for everyone: How students with reading-related learning disabilities survive and excel in college courses with heavy reading requirements

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Introduction

Students with learning disabilities are entering post-secondary settings in ever greater numbers (Henderson, 1995; Perreira, 1988; Raskind & Higgins, 1998; Vogel et al., 1998). While the term learning disabilities applies to a variety of functional characteristics, over 80% of all identified learning disabilities (LDs) are estimated to be reading-related, influencing students' abilities to access and comprehend written material (Lyon, 1996, 1999). At the same time, most college courses transmit content primarily through reading and lecture (Ingram & Dettenmaier, 1987; Pugh, Pawan, & Antommarchi, 2000; Rulh & Suritsky, 1995). These methods of transmission, coupled with particular students' neurological and functional characteristics, can create barriers to learning for students with LDs in the post-secondary setting. Often, the goals of a course (e.g., understanding of relationships in history) are inadvertently pursued in a manner (e.g., via printed text) that make it difficult for students with LDs to achieve the course goals.

Numerous studies have been conducted on the reading and study strategies of typically developing students. These studies have found that the most successful individuals understand and use a variety of active study strategies to control and monitor their learning (Garner, 1987), applying particular strategies only when appropriate. Successful students can explain the strategies they use, and can describe whether or not particular strategies prove useful in particular situations (Andre & Anderson, 1979; Brown, Campione, & Day, 1981; Garner, 1987; Perreira, 1988; Tei & Stewart, 1985; Wood, Motz, & Willoughby, 1998). Such activity requires the use of metacognitive monitoring and evaluation to detect whether particular strategies are working in particular contexts and to modify study behaviors accordingly (Allgood, Risko, Alvarez, & Fairbanks, 2000; Bielaczyc, Pirolli, & Brown, 1995; Perreira, 1988; Wade, Trathen, & Schraw, 1990).

Although the range of possible strategies is large, researchers as long ago as 1950 found that most typical college students knew effective learning strategies but did not use them (Perry, cited in Speth & Brown, 1990). More recent studies confirm this finding (Feldt & Ray, 1989; Thomas & Rohwer, 1986; Wood, Motz, & Willoughby, 1998). Researchers have consistently found that the vast majority of typical students, even those at elite Ivy League colleges, limit their study strategies to methods of rote learning such as underlining/highlighting and re-reading (Annis & Annis, 1982; Caverly, Orlando, & Mullen, 2000; Feldt & Ray, 1989; Hare, 1981; Hare & Pulliam, 1980; Novak, 1990; Wood, Motz, & Willoughby, 1998), strategies that often allow these students to "get by."

Unlike typical students, students with LDs often do not meet minimal standards when employing only basic strategies for learning. Many students with reading-related LDs have trouble taking notes, grouping material effectively, understanding and processing auditory information, handwriting and spelling, and maintaining attention (Ruhl & Suritsky, 1995). For these students, the development of study and test taking skills (including metacognitive strategies) is not just beneficial; it is often critical for success in post-secondary settings (Ellis, Sabornie, & Marshall, 1989). Students with learning disabilities who succeed in college settings presumably develop creative strategies to compensate for their weaknesses.

Despite this, almost no research has been done to determine and document the study and reading strategies that do and do not work for students with LDs in college settings. I have identified four researchers – Goldberg, Cowen, Poljanec, and Fink – who have conducted research studies relevant to this topic. Goldberg (1983), Cowen (1988), and Poljanec (1991) each investigated study strategy use by students with LDs in typical college settings. Fink (1991, 1992, 1996, 1998) conducted retrospective interviews with successful adult dyslexics, some of which provides information that informs the work on study strategies. On the basis of these studies, I have synthesized the strategies used by students with LDs cited in the literature as represented in Table 1, below.

Table 1: Categorization of study-reading strategies used by students with learning disabilities in recent research.

General strategy	**Specific strategies reported**
Strategies that help students take in representations of knowledge or understanding.	Use visual diagrams (Goldberg, 1983). Visualize content of text (Fink, 1992). Use subvocalization when reading (Cowen, 1988; Poljanec, 1991). Listen to audio recordings of text, lecture notes (Poljanec, 1991). Use motor behaviors to reinforce learning (Goldberg, 1983). Use mnemonic techniques for memorization (Poljanec, 1991). Listen but don't take notes (Goldberg, 1983). Use flashcards (Poljanec, 1991). Buy used books already highlighted (Cowen, 1988). Attend class regularly (Cowen, 1988).
Strategies that help students express their knowledge or understanding.	Substitute easier words when writing (Cowen, 1988; Fink, 1992). Use a dictionary/spelling list (Cowen, 1988; Fink, 1992). Print in capitals/write letters idiosyncratically (to distinguish between letters that cause confusion) (Fink, 1992). Use various methods of highlighting (Poljanec, 1991). Complete work ahead of time/a little bit at a time (Poljanec, 1991). Use human resources to catch errors in production/understanding (typists, proofreaders, readers) (Cowen, 1988; Fink, 1992; Goldberg, 1983; Poljanec, 1991). Complete all homework (to offset poor test scores) (Cowen, 1988).
Strategies relating to support, challenge, and motivation.	Put in more time and effort than peers (Goldberg, 1983; Poljanec, 1991). Study/read in quiet environment without distractions (Cowen, 1988; Poljanec, 1991). Keep daily/weekly schedule (Cowen, 1988; Poljanec, 1991). Select courses carefully/schedule a balanced load (Cowen, 1988; Goldberg, 1983). Drop hard subjects (Goldberg, 1983). Complete courses in areas of difficulty at less difficult/more supportive community colleges (Cowen, 1988).

While these four studies broke new ground in the identification of strategies used by post-secondary students with LDs, various characteristics prevent them from adequately describing students' use of successful and unsuccessful strategies in typical post-secondary settings. Only Poljanec's study focuses specifically on students with reading-related learning disabilities in a typical college setting, and only one of the six students in her sample was identified as not successful, making data based comparisons between students' successful and unsuccessful practices preliminary.

In addition, the majority of the data on student strategy use – both with students who are typically developing and those with learning disabilities – have been collected through the use of surveys or retrospective interviews. I sought to add to the field's knowledge of student strategy use by conducting a different kind of study in order to identify strategies that were related to successful and unsuccessful experiences in particular college courses. My study is qualitative and prospective. I followed a sample of college students with reading-related learning disabilities in courses that required heavy reading over the course of a term or more, collecting data from a variety of sources.

Research questions

The research questions that guided my study were:

- What reading and study strategies do students with identified reading-related learning disabilities employ at the post-secondary setting?
- How does use of strategies differ for students who succeed in particular courses versus those who do not do as well?

I investigated not only what strategies my sample of students with reading-related learning disabilities talked about and used in particular courses with heavy reading requirements, but how these strategies correlated with the students' perceptions of their abilities, the requirements of the courses, and the students' educational goals. I did so by attempting to get to know the students in the study over time and to look at their behavior and decision making in the context of their wider experience of college.

Methodology

Location

I selected my sample of students from a single large, urban, non-elite, four-year college in the northeastern portion of the United States that I will call Citycenter University. The school is diverse in terms of entering students' previous academic achievement, socioeconomic status, country of origin, culture and race. The school also has a large population of students with learning disabilities, and is strict in its procedures for identifying students as having a learning disability (requiring the results of a variety of relevant measures of achievement and a thorough neuropsychological exam).

Sample selection

I selected my sample from those undergraduate students attending Citycenter who had been identified as having a reading-related learning disability (such as dyslexia or a visual processing disorder that affected reading) by Citycenter's office of disability services and who expressed interest in participating in the study. (Because of privacy

issues, I recruited students through print fliers and word-of-mouth at the office of disability services; I did not receive information about the disability of any student until the student knowingly and voluntarily disclosed their disability to me in order to participate in the study.) Students who also had non-reading related learning disabilities (such as dyscalculia) or attention deficit disorder (ADD) were not excluded from the sample as long as the student also had a reading-related learning disability. In addition, sample participants needed to be enrolled in at least one course that required heavy reading at the time of the study, and needed to be eighteen years of age or older (for purposes of informed consent). Students were given a stipend for their participation each term.

Nine students participated in the study, with two of the nine participating over two terms. The students in the sample included males and females taking a variety of courses that required heavy reading, and ranged in college experience from first term students to students in their last term at Citycenter. Table 2 lists the students who participated in the study (called by pseudonyms they chose themselves) and the subject of the heavy reading course I focused on with each, arranged by year in school.

Table 2: Students who participated in the study (names are pseudonyms chosen by the students themselves).

Frosh
Logan Miller (Sociological Perspective on Drug Use)
Richard Callahan (Sociological Perspective on Drug Use)
Chloe Richards (Intro to Psychology)
Sophomores
Gabrielle Stone (Psychobiology of Mental Illness)
Danielle Brower (College Writing, Art History survey)
Jack Cook – transfer student (Intro to International Business)
Junior
Jen Christopher (History of Journalism)
Seniors
Sylvia Hughes (Contemporary Poetry)
Lisa Smith – transfer student (Audiology, Psychology of Adult Development)

Data collection

I followed each of the students in the sample independently through one or more terms at Citycenter, collecting a variety of data over the course of the term in order to have multiple forms of evidence with which to evaluate hypotheses about practices that led to success. While I had specific information I wanted to gather, in interactions with students I focused closely on their statements, building on their comments with my questions and often asking students to clarify what they meant. At all times, I dressed

and presented myself as a young graduate student researcher, emphasizing that I was not affiliated with Citycenter, and did not care what the student was "supposed" to do, but what he or she really did. This non-judgmental approach worked well and students shared a great deal of information. Data types and amounts collected, as well as the purpose for each, are summarized in Table 3, below.

Table 3: Categorization of data collected during the study.

Data type	**When collected**	**Purpose**	**Amount of data (over nine students)**
Interviews with students (audiotaped and transcribed)	Weekly throughout term (excluding finals) and once after term was complete (each student; each term)	Collec: longitudinal data on student perceptions, progress, and activities; learn about student's background, beliefs, goals for life, college	7 to 13 interview tapes of 1-2 hours each per student (80 total)
Observations of student study behavior (videotaped and transcribed)	Two or three times during the middle of the term, once the student and I had formed a relationship (each student; each term)	Collect specific data documenting student's use of particular strategies	2 or 3 videotaped episodes of 1-2 hours each per student (24 total)
Observation of typical class meeting (audiotaped and transcribed)	Once each term with instructor's consent (each student; each term) [I did not identify the student to the instructor or acknowledge or focus on him/her while observing the class]	Collect independent data on nature of course meetings (in addition to student report)	1 observation for each term for each student (9 audiotapes, 10 observations total – 2 students took the same class; 1 instructor preferred I take only field notes)
Collection of student work, assignments, textbooks, study aids, etc. (names eliminated)	Generally at the end of the term, when the student was finished with course materials (each student; each term)	Collect artifacts to compare with student reports of reading and strategy use and course assignments and performance	Items for each student, depending on materials for the class (13 original textbooks with student markings; photocopies of 3 additional texts with student markings; notes, assignments, syllabi, papers, exams, flashcards, etc.)

Field notes	Weekly throughout term to summarize main points of interaction; during each course meeting visited and each student observation (each student; each term)	Keep track of important events and realizations during course of data collection	More than 100 pages of notes
Emails from students to me and back (identifying information eliminated)	Whenever students and I emailed (all students; several times during term)	Make logistical arrangements; gather data on the way students communicated with me in writing	25 to 75 email interactions per student (347 emails total)
Final grades for all classes during term	At final meeting with student (each student; each term)	Evaluate student's performance in course we were focusing on, in all courses that term	Grades for all classes during each term of participation for each student (11 terms total)
Instructor grade distributions	At end of term, from instructor (each instructor)	Evaluate student's performance in context of different instructor grading practices	Grade distributions for all classes (10 total – two students took the same class)
Student disability summary	At end of term, from disability office (with student's consent) (each student)	Capture information on nature of student's particular disability according to the university	Reading and vocabulary scores and summary for all students (9 summaries total)

Analysis and Findings

Because of the nature of the data, I am reporting analysis and findings together in two parts: 1) who was successful, and 2) what strategies were associated with success in the sample.

Who was successful

To determine who was successful, I compared students' grades in the classes we focused on. Simple ranking by grade was not adequate. It did not take into account, for instance, that Sylvia's poetry instructor did not give any As while Lisa's Audiology instructor gave no grade lower than a B, making their B+s unequal. (Sylvia also demonstrated a relatively sophisticated understanding of the material in her class in our meetings.) I tried considering the difficulty of courses in the ranking, but most of the courses the students took were introductory in that they required no pre-requisites. I finally placed the student grades in the context of instructor grading practices, arriving at the classifications of

success depicted in Table 4. I should note that unlike at some elite schools, Citycenter instructors tend to give grades across the full range from A to F.

Table 4: Classifications of students' success, adjusted for instructor grading practices

Very successful (75th-99th percentile of class)
A Chloe (Intro to Psychology)
A Danielle (Art History survey)
B+ Danielle (College Writing)
B+ Sylvia (Contemporary Poetry)

Somewhat successful (50th-75th percentile of class)
B Logan (Sociological Perspective on Drug Use)

Marginally successful (25th-50th percentile of class)
B+ Lisa (Audiology)
B- Lisa (Psychology of Adult Development)
C+ Gabrielle (Psychobiology of Mental Illness)
C+ Jack (Intro to International Business)

Not very successful (borderline 0-25th/25th-50th percentile of class)
C+ Jen (History of Journalism)

Not successful (1st –25th percentile of class)
C- Richard (Sociological Perspective on Drug Use)

Chloe and Danielle earned one of a handful of As in their large classes; they were undoubtedly successful according to any grade-based perspective we could take. Similarly, only two students out of 151 did worse than Richard did in his class; he was undoubtedly unsuccessful from a grade-based perspective.

While there are many ways to describe success that could be supported by my data, for the purposes of this paper I am using grade and rank in course. Though students in the study were motivated for different reasons, all subscribed to the idea that good grades are a mark of success in college.

Strategies associated with success

In order to determine what strategies were associated with student success, I, along with two other researchers who had never met or interacted with the students in the sample, independently coded a sub-sample of the data for themes and strategies mentioned and used by students in the sample. We examined the first two interviews I conducted with each student (in which a variety of topics, including goals and background, were discussed); the final interview with each student (which was a rich discussion of what happened during the term and why); and the second videotape of the student working on material for class.

The researchers and I then discussed our findings together. While we are all successful students and trained researchers, we come from three different perspectives that inform the analysis in different ways. One of the researchers has a reading-related learning disability; one tutors students with learning disabilities professionally; while I have neither an identified learning disability nor a job working with students with learning disabilities, except in a research capacity. (I do have in-depth knowledge of all the students in the sample gained through my extensive data collection process for this project.)

At first, I tried connecting the strategies from past research on students with LDs (Table 1) with students in the sample who used these strategies. No useful patterns emerged. I believe the methodological limitations of past studies (focusing closely on student reports of study practices through surveys and retrospective interviews) have caused researchers to report on study and reading routines or practices, like many items listed in Table 1, rather than study strategies. Strategies vary based on context and feedback, and thus require a data collection process that takes context and perspective into account.

With this in mind, I grouped the themes and strategies that the researchers and I had identified directly from the sub-sample of data, looking at which strategies were and were not used by particular students in the sample. Through this process, I was able to identify a list of more general strategies and personality characteristics that we believe are predictors of success in the sample. This list of strategies is contained in Table 5, below.

Table 5: Predictors of success in the sample.

Structure
1. Effective time management
2. Taking care of self
3. Making connections
4. Choosing courses carefully

Social
5. Talking to others to get information
6. Finding and using mentors
7. Finding and using a supportive peer group

Self-image
8. Drive, passion
9. Being open to asking for and receiving help
10. Taking responsibility for self

Savvyness
11. Savvy prediction of assessments
12. Matching work to assessments
13. Modifying strategies based on feedback

While the large amount of data I have collected allows me to describe the relative success of particular students in elaborate and complex ways, I will present a few slices of information on three sets of students to provide evidence for the items on the list of strategies. I'll briefly describe the experiences and practices of three students in the sample who were successful, a student who was unsuccessful, and two students who enjoyed some success in the course on which we focused.

1. Danielle (Successful): Danielle was very successful in her art history class. She consistently made connections between her work in that class and other classes, and between her work in that class and her major and future plans. Danielle was careful to achieve a balanced load of courses that did and did not require reading each term, and she was quick to drop a course if she felt she did not have adequate support (such as a tutor) to complete it effectively. Danielle often talked to other students who had taken courses to evaluate if she wanted to enroll in them, and she had a large group of friends who provided emotional support, as did her mother. She was not ashamed to ask instructors for additional information about what they wanted, and used the campus writing center and tutors frequently. She was extremely savvy about what the instructor was looking for, and read selectively to match what was needed for assessments, changing her strategies during a course to match her growing understanding of what was required.

2. Chloe (Successful): Chloe was very successful in her psychology class. She also made many connections between the course and what was important for her to learn in preparation for a future career in psychology. Chloe took a reduced course load that was balanced between her strengths and her weaknesses so she would be sure to have a good chance of being able to keep up with her work and do her best. Chloe spoke often with other students who were taking the same courses she was to get feedback on her understanding of course requirements and content, and she had a circle of friends who supported her in her efforts to study. Her mother also helped her manage the frustration she sometimes felt at having to work harder than other students; in my experience, Chloe was enthusiastic, even-tempered, and thoughtful. Chloe met twice weekly with a tutor who served as a non-judgmental mentor and who helped Chloe keep on track with her schoolwork. When her dorm was noisy and she had a test to prepare for, Chloe took responsibility for herself by taking her Ritalin and going to the library to study. She understood that she should match the amount of work she put in to the weight of that work in course assessments, and Chloe modified the way she read her textbooks and prepared for exams based on self-monitoring of her understanding and progress.

3. Sylvia (Successful): Sylvia was quite successful in her poetry class, though she was disappointed not to receive an A in the course. Sylvia made many links between her course work and her understanding of the topics more generally, choosing as much as she could to take courses in areas in which she had a passionate interest and a large knowledge base. Sylvia often took courses with instructors she already knew and liked, and avoided math and science, two topics she disliked and did poorly in, entirely. Sylvia's circle of friends were supportive of her studying and doing well, and she often used instructors from earlier terms as mentors and resources for her current assignments.

Her goal in her courses was not only to earn an A, but to form a friendly relationship with the instructor (when she was able to do so, this created her feeling of self-worth). Sylvia had great passion for the topics she studied. While I would not consider her savvy about instructor expectations (she put in far more work than was expected in most cases), her behavior should probably be evaluated in the context of her goal for school, which was to form relationships with instructors which she achieved by going above and beyond the call of duty.

4. Richard (Not successful): Richard was not successful in his sociology class and also did very poorly in another class the same term. He had trouble balancing his social life with his school work, and did not take very good care of himself (getting little sleep and likely eating poorly and drinking excessively). While Richard was smart and savvy about my expectations for the research project, often predicting my questions before I asked them, he was not able to predict what would be required for his school assessments very accurately. Richard would sometimes think he did well on a test, only to learn that he had done poorly when the grades were given. He also did not make connections between his work for his classes and his future plans. Richard had developed a strategy of working alone in high school on homework which he continued to use in college. He seemed to trust that by doing the homework he would come to an adequate enough understanding of the material to do well in the course, which in college is not always the case. Richard did not talk to other people very much to get information and did not work in study groups. While he was able to derive emotional support from a friend in his all-frosh dorm, as far as I can tell, Richard did not form a relationship with someone who was more experienced than he was who could act as a mentor. While Richard indicated that he just wanted to fit in with a group of friends and would have been happy to do whatever they did (be it studying or partying), he ended up with a group of friends who most often did the latter.

5. Jack (Somewhat successful): Jack would have preferred to have done better in his business course, but Jack did do well in parts of the class and exhibited many characteristics of a successful student. Jack knew what he wanted to do for a career and made smart connections between his courses, his past experience, and his future plans. Jack cared about what he learned. Still, Jack, as a new transfer student, had some difficulty finding a supportive and friendly peer group. He tended to work alone and did not go often to the instructor or tutors for information about course content (though he did interact with the instructor some over grade issues). Jack had no one to play the role of supportive mentor for him and he sometimes had trouble taking in instructor feedback and cues. For instance, when he received his graded midterm exam, he discounted some of what the instructor wrote in his blue book, claiming she was wrong, rather than trying to figure out how to ensure that he knew the material and she knew that he knew it. He claimed that the instructor in his business class wrote everything a student needed to know on the board. When I visited the class, I found a lot of discussion central to the understanding of the topics that were written on the board was not recorded anywhere, including Jack's notes. While Jack did not do as well on the midterm as he would have liked, he used the same study techniques to prepare for the final exam as he had used for the midterm. I think, had Jack talked more to other people (including instructors)

regularly to assess his understandings of content and expectations and worked in study groups, he would have been much more successful in his courses.

6. Gabrielle (Somewhat successful): Gabrielle would also have preferred to do better in her psychology course, but she was pleased she did as well as she did given the circumstances of her term. Not only did Gabrielle mistake the type of course she would take, thinking it would be behaviorally and not biologically-based, illness and death within her circle of close friends and family caused her to miss a portion of the term. In addition, her instructor also had a family crisis that caused her to cancel a number of classes. Coupled with Gabrielle's difficulties making connections between abstract concepts she cannot picture, Gabrielle's absence from school made her task of understanding the psychology difficult. Gabrielle understood her strengths and weaknesses well, cared about her work, and created a smart schedule for studying that included adequate time to rest. She worked consistently with a tutor and simply did not give up when she encountered difficulty. Gabrielle understood that she needed to match her learning strategies to a given course, but did not have a strategy in her repertoire that would match what was needed in the psychology course. Instead, she memorized as much as she could and did her best to use multiple sources (notetaker's notes, her own notes, textbook, tutor) to understand the material as best she could. In the future, she will be careful to avoid any courses that involve biology that she cannot picture. Gabrielle takes great responsibility for herself; I would describe her as a generally successful student who had difficulty in the particular course (and similarly structured courses) on which we focused.

I note that some of these strategies parallel what Light has found in his qualitative interviews with typically developing Harvard undergraduates (Light, 2001), especially the issues of difficulty managing time and the importance of learning through interactions with other people. Recent work by Simpson and Nist (1997) looking at typically developing students in a college history course also has some parallels, though they focused more on understanding the requirements of the instructor and the course, while I focused more on students' experiences and documented practices.

Implications

The thirteen strategies I have identified have implications both for individuals and for institutions.

Implications for individuals

This research study suggests that there are a number of general strategies that students, taking into account their own strengths, weaknesses, and goals, can use to create their own specific strategies in college. I expect that these general strategies have applicability for many populations in addition to college students with learning disabilities. In fact, I find the strategies helpful to consider in my own work, in settings outside school. Specific examples of how college students might apply each of the strategies follow:

1. Develop a plan for effective time management that includes doing a little work each day (even when a deadline is not looming) and adequate time for rest. Every single

student in my study struggled with this issue. Still, those who put in time ahead of deadlines tended to do better than those who spent the same amount of time at the last minute.

2. Take care of yourself. Develop ways to ensure you get adequate rest and recreation, that you supplement dorm food with nutritious food, and that you are careful about alcohol consumption. Find supports that will help you manage the frustrations of classes and daily life (talk to friends, talk to professional counselors, get exercise).

3. Make connections between what you are doing in different classes and between your classes and your future plans. Ask how what you are doing now relates to what you want to do next.

4. Choose your courses carefully so that you have a balance of courses that will be hard and easy for you. Mix courses that do and do not require lots of reading.

5. Talk to others to get information. Talk to students who are taking the courses you are taking, and students who have taken them. Get to know instructors and teaching assistants and find out what they expect.

6. Find and use mentors. Mentors may be tutors, parents and more experienced friends who are knowledgeable about college, people in your field of study, and professors. Talk to these people and ask them to help you think about what you can do to be more effective in reaching your goals.

7. Find and use a supportive peer group. Try using study groups to check your understanding of material and prepare for exams. Make sure your friends are supportive when you need to study or do work.

8. Have drive and passion. If possible, find something you really care about in college and for a career and focus on it. Do not give up when something is hard; instead, look for additional sources of help to get you through.

9. Be open to asking for and receiving help. Don't be embarrassed when you don't know something; good instructors don't expect you to know and understand everything immediately. Ask people for help, and check your understandings with professors or experts even if you think you know the material.

10. Take responsibility for yourself. Realize you are ultimately responsible for learning the material, keeping yourself on track, and making use of available resources. Develop plans for doing your best even when courses are not well-taught or do not match your preferred methods of learning.

11. Predict assessments. Think about what the instructor expects for each assignment or exam, and check your predictions with the instructor or others to be sure you are on track.

12. Match work to assessments. Learn the material so that you can do well on what you will be graded on, in the way you will be graded on it. This may mean skipping part of the reading if you already understand it, or doing extra reading or getting extra tutoring if you don't understand the material even after doing the assignments. Memorizing your lecture notes will not be enough preparation for a test in which you need to apply what you know; think about what you will have to do and link that to how you decide to prepare. Spend more time on the material that is worth a larger percentage of your grade, and spend more time on the material you understand less.

13. Modify your strategies based on feedback. Keep asking yourself if you understand the reading and the lectures as you go through them. Look carefully at what comments you get from the instructor and what questions you miss on exams and learn from your mistakes. Did what you did to prepare help you understand the material in the way you wanted to? If not, or if it took too much time, think about how you might prepare differently next time and try a new way.

Implications for institutions

While students are ultimately responsible for their own experience, in this study, I documented many instances in which the learning setting was structured in a way that made it harder for students to succeed. Based on this data, I have some preliminary suggestions for institutions:

1. Do not place students in all frosh dorms. All frosh dorms do not provide natural places for students to meet mentors and see models of effective study, self-care, and time management practices of more experienced students.

2. Provide quiet study areas in dorms. Some students are housed far from the library and prefer to study in their dorms when they have many materials to carry, the weather is poor, or it is late at night. Providing quiet study areas is especially important when rooms are shared.

3. Break large classes into smaller sections. This allows students to have more access to instructors and teaching assistants and possibly make connections with people in a way that does not happen in a large lecture hall.

4. Clarify assessment criteria. Some students are capable of doing well if they understand what is expected. I will argue that students should be graded on their understanding of the material, not their understanding of the instructor's expectations.

5. Provide feedback on students' work/performance. In many cases in my study, tests were not returned (only scores reported) to avoid cheating in future terms. Several students never received feedback (or even their scores) on final papers and exams that determined most of their grades. Students cannot modify their strategies for learning material based on feedback if they don't receive any feedback.

6. Craft homework carefully. Students will focus on the homework instructors assign and grade. While it is the student's responsibility to make sure he or she understands the material, I saw in my sample that the smarter the homework assignment, the more likely the student was to understand the material and not cut corners.

7. Provide opportunities for practice. If the goal is to help the student understand the material, then the student benefits from having the chance to practice the material in an authentic way before he or she is graded.

8. Spread assignments over the term. Many classes have the majority of the assessment at the very end of the term. With this structure, students often get bogged down by the sheer amount of work and are unable to put forth their best effort because of time constraints during finals. Spreading work over the term also allows the student to get feedback and modify practices before a final grade in the course is given.

9. Give course assignments to writing/tutoring centers. Some students actively seek help from campus help centers but are unsure exactly what is expected of them or how to begin to ask questions. Having instructors' assignments would help those working at these centers better understand how to help the student focus his or her efforts in an intelligent way.

Conclusion

While most research studies end with the caveat that more research is needed, in this case I emphasize that more analysis can be conducted. I have a wealth of data from a great number of sources and can (and will) continue to conduct analyses to test counter or additional hypotheses about student behavior and success in this sample. Comments and critiques are wholeheartedly welcomed.

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